Report to the

Senate Committee on Agriculture and Water Resources

and the

Assembly Committee on Agriculture

Dairy Marketing Study



Submitted by the
California Department of Food and Agriculture

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Executive Summary

Federal Forward Contracting Program

- The Dairy Forward Pricing Pilot Program (DFPPP) commenced in August 2000 and allows for direct pricing contracts between dairy producers and dairy processors in federally regulated milk markets.
- Preliminary reports from USDA regarding the effectiveness of the DFPPP will not be available until October 2002.
- In general, participation by producers in forward pricing contracts has been low, particularly in the Western, Northeast and Southeast federal milk marketing orders.
- Cheese plants have offered nearly all of the contracts on record.
- An example of how forward contracting may work shows that, while milk prices may be more stable, they are not necessarily higher than the regulated minimum price.

Forward Contracting Programs Operated by California Cooperatives

- Two cooperatives in California have offered forward contracts to their producer–members. These programs operate internally; the cooperatives develop and administer the programs.
- Using participation rates as an indicator, producer–members have an interest in forward contracting programs developed and administered by cooperatives but are reluctant to rely on them as the exclusive source of revenue.

Forward Contracting Programs Proposed to Operate Within and Outside of the Pool

- Legislation for a forward contracting program in California was introduced in 2000 but was not passed. The proposed program would have mimicked the program in federally regulated milk markets in many respects.
- Two examples using data from 2000 and 2001 show that, under the proposed program, processors receive a fixed price while the price to participating producers may be higher or lower than the contract price.
- The forward contracting program, as proposed, may help to stabilize milk prices but will not necessarily result in higher or lower producer milk prices.
- A forward contracting program that operates outside the pool has not been formalized by the dairy industry because of potential violations of minimum pricing provisions and because of the unavoidable impact on non–participating producers resulting from depooling milk.
- Two examples using data from 2000 and 2001 show that non–participating producers would usually receive higher prices if the forward contracted milk did not participate in the pool. However, there are numerous months in which prices to non–participating producers would be lower if the forward contracted milk was not pooled.

- Past price data is not necessarily a good predictor of the future price data. Any analysis using historical price data should be viewed as a tool to highlight potential impacts for the given data set. Different data would be expected to yield different results, and possibly, different conclusions.

Mandatory Pooling of Class 3 Milk

- Reverse osmosis technology has been introduced as a practical means to concentrate milk on–farm. The concentrated product can be shipped at a fraction of the cost of shipping raw milk.
- Ice cream plants have been able to use the concentrated product to manufacture acceptable if not superior products.
- Because milk used by ice cream plants does not have to be pooled, a relationship between a producer and an ice cream processor could be developed such that the transaction occurs outside the pool.
- The producer would stand to reap large financial gains if paid the Class 3 price directly.
- In most months from January 2000 to December 2001 in which a percentage of Class 3 milk is not pooled, pool prices would have been lower. In a few of the months, pool prices would have been higher if Class 3 milk was not pooled.
- On an annual average, pool prices would be very slightly lower if Class 3 milk was not pooled.

Protein Pricing

- Premiums are financial incentives paid above the minimum class prices directly to producers for measurable milk quality characteristics, e.g., higher protein levels.
- Proponents of protein pricing suggest that the evolution of milk pricing dictates that valuable milk components should be captured and be part of regulated prices.
- Proponents of protein pricing suggest that implementation will re–establish equity among producers and to share equally the higher value obtained from milk used to make cheese.
- If protein pricing were adopted, premium levels would likely be reduced and money would be transferred from producers who have received premiums to all other producers.
- Cheese processors and dairy producers shipping to them will likely oppose any attempt to institute protein pricing, i.e., regulated prices paid based on protein levels in milk.
- A protein pricing structure will not have a significant impact on retail prices.
- Using a formalized protein pricing proposal that was introduced in 2000, implementation of protein pricing would have increased the Class 4b price by an average of $0.42 per hundredweight from 1994 to 2001.
- The Department is not currently authorized by the Food and Agricultural Code to develop pool prices based on protein.

I. Introduction

Senate Bill 870 (Costa), signed into law in the fall of 2001 (Food and Agricultural Code, Section 62765), mandates that the Department of Food and Agriculture (Department), after consulting with its Dairy Advisory Committee, shall complete a study of various proposals affecting regulated milk pricing and pooling programs. As suggested by the legislation, the report reviews and discusses three controversial issues that have been circulating in the dairy industry — forward contracting of milk, mandatory pooling of Class 2 and 3 milk, and protein pricing.

The Department called a meeting of the Dairy Advisory Committee (DAC) on January 10, 2002, to gather input from the industry concerning the points to be covered in the study. Participants suggested many possible angles from which to approach the topics to be covered in the study. However, the underlying request from most participants was that the study be as comprehensive as possible, review impacts and risks for each issue, and discuss how possible resolutions to the issues might interface with the current regulations. The Department endeavored to provide as much discussion and answer as many questions as possible. The report is comprehensive and covers a wide myriad of topics, but not every question raised by the DAC is answered. For example, questions were raised about forward contracting and the changes to the value of quota, the impact of forward contracting on market prices and demand, and the development of options for implementing a forward contracting program in California. The Department was not able to analyze these and other similar questions. In some cases, the topics were too general or the data were not available to conduct meaningful analyses. In still other cases, the Department saw the issues as being better suited for industry–wide discussion and resolution rather than the Department attempting to develop details in a vacuum.

A quick review of the three issues and the positions taken by different factions in the dairy industry reveals that the major points of contention are perhaps based less on economics and more fundamentally on policy, i.e., to what extent should government play a role in regulating milk markets? In regard to the California dairy industry, matters of policy can be resolved in two separate venues — in the legislative arena or through public hearings at the department level. As such, the report is short on positions taken by and recommendations for resolution from the Department. In the event that a matter of policy is to be resolved through the hearing process, the Department needs to remain neutral on the issue until the hearing record is closed. Issuing a recommendation prior to a hearing clouds the Department's role of being impartial and unbiased.

In the course of addressing the topics for study, the report references basic milk pricing policy and risk management activities and strategies. Before attempting to read the report, most readers will find the following primers

helpful in understanding the particulars of milk pricing and risk management in the dairy industry.

II. Milk Pricing in California

California minimum prices paid for milk by processors to producers are determined through a system of economic formulas. Two of the most basic features of the pricing system are that processors pay different prices for milk according to how the milk is used and payments to producers are made according to a schedule of quota and overbase prices. The next two sections describe class prices and pool prices and the difference between the two.

II. a. Class Prices

California's milk marketing program establishes minimum prices that processors must pay for fluid grade (Grade A) milk received from dairy farmers based on what products are made from the milk (termed "usage"). Currently, California sets minimum prices for five classes of milk. In general, the classes and the products they contain are:

Class 1: Milk used in fluid products.
Class 2: Milk used in heavy cream, cottage cheese and yogurt.
Class 3: Milk used in ice cream and other frozen products.
Class 4a: Milk used in butter and dry milk products, such as nonfat dry milk.
Class 4b: Milk used in cheese, other than cottage cheese.

Class prices are determined by economic formulas that rely on commercial market prices for three dairy commodities — butter, nonfat dry milk and Cheddar cheese. In the formulas, commodity prices are adjusted by manufacturing cost allowances and yields specific to California, which allows for the calculation of a milk price based on end–product prices. In general, Class 1 prices are higher than Class 2 prices, which are higher than Class 3 prices, which are higher than either Class 4a or 4b prices. Federally regulated milk markets use a similar schedule of classified prices. There are two technical differences in the two pricing systems — the federal system uses Roman numerals to designate classes (Classes I, II, III and IV) and four classes are used instead of five (California's Classes 2 and 3 are equivalent to federal Class II).

II. b. Pool Prices

While class prices specify how money is paid into a pool of revenues, "pool prices" specify how the money is paid out to producers. Payments to California milk producers are determined through a schedule of quota and overbase prices (termed "pool prices"). They are derived from revenue generated by processors that pay the minimum class prices for all milk processed in their plants. The five separate class prices and each plant's individual usage

determine how much money is paid into the pool. Each month's production of quota milk and overbase milk figure prominently in calculating what the pool prices will be once the pool is established.

Quota is essentially an entitlement that gives the producer who owns the quota a higher price. Quota has a market value and can be bought, sold and traded just like any other asset. Thus, holdings of quota can range from 0 to 100 percent of a producer's milk. Currently, there is a $1.70 spread between the announced quota and overbase prices at 3.5 percent fat and 8.7 percent solids–not–fat (SNF) test.

III. A Primer on Risk Management in the Dairy Industry

Throughout the 1970s and 1980s, prevailing milk prices tended to be stable. This was the result of the federal government's high support prices, which served to mute price signals from the marketplace. As the support price level has dropped, the volatility of dairy commodity markets has become more influential. Consequently, minimum prices, which rely on commodity prices, have become less stable and less predictable.

The use of tools to manage prices received or prices paid is a departure from traditional business conduct in the dairy industry — that is, producers and processors both have tended to be price takers, not price makers. The development of risk management tools in the dairy industry gives producers and processors the ability to reduce the inherent price instability in an industry that depends on the marketplace for price information. Specifically, both producers and processors have available to them futures contracts, options and swaps. Each of these tools is discussed below.

III. a. What is Risk?

Risk is the probability of an alternative (perhaps negative) outcome — the higher the probability, the higher the risk exposure to the individual or the firm. In the dairy industry, everyone can appreciate a specific kind of risk — price risk. One example of price risk is fluctuations in input costs (such as milk) that may affect the financial stability of a processing company. Another example of price risk is variability in the price received by producers for milk sold every month.

III. b. Cash Contracts, Forward Contracts and Futures Contracts

Everyone is familiar with cash transactions; they occur everyday. Simply, cash transactions are characterized by immediate and simultaneous payment and delivery. When cash transactions are made, supply and demand are known, and price is relatively easy to determine. In contrast, a forward contract requires a price negotiation (and, perhaps, actual payment) in advance of when services or the product are delivered. Forward contracts are made without

agreement as to what supply and demand might be at a future date. Negotiations on the contract price may be evident because of the length of time that elapses from the date of discussion until the contract's delivery date and the forecasts made by the buyer or the seller.

The primary benefit of forward contracting is the reduction of price risk, which comes about because the price is agreed upon in advance of the actual transaction. However, a number of detracting points are worth mentioning. First, the contract is binding and is impossible (or nearly so) to cancel. Second, although the contracts are binding, they are not guaranteed, and as a result, one party may be subject to default risk. Third, because the price is likely to "move" from what was agreed upon, the buyer may pay more or the seller may receive less than the going rate. The reverse, of course, also may be true. Fourth, the contracts include specific terms and are unique to the original parties involved. Consequently, they are not easily traded to a different party.

Whereas forward contracts are not easily exchanged between parties because they are very specific in their terms, the terms of the futures contract make them homogeneous and "tradable". A futures contract is a sales contract that specifies a description of the commodity to be traded, the quantity of the commodity to be traded, the delivery point, the delivery period and the terms of delivery. In short, all details of the transaction with the exception of price are fixed and known in advance; potential buyers and sellers understand that price is the only variable remaining that must be negotiated. The most significant feature of futures contracts is that they shift price risk to other parties involved in futures markets who are willing to take on risk in hopes of a future payoff.

Futures contracts have two other unique characteristics to set them apart from forward contracts. First, contracts can be legally cancelled by taking an equal and opposite position because the contracts are generic, tradable and not personal. This means a person who purchased a futures contract may offset his or her position by selling a futures contract identical to the one being held. The opposite position effectively cancels the person's original position. Second, an exchange, such as the Chicago Mercantile Exchange, acts as a common guarantor of all contracts; the exchange covers the contract in the event that one party defaults. About 90 contracts are available on 10 exchanges, which are located mostly in Chicago and New York. Because trading volume and market "thinness" are a concern for exchanges, futures contracts are available for certain products only. On the Chicago Mercantile Exchange, dairy futures are traded on federal Class III milk (cheese) and federal Class IV milk (butter and powder) and for finished butter.

III. c. Hedging and Speculating

In general terms, a hedge is a guard against a loss by making a counterbalancing "bet". More specifically, the objective of hedging is to maintain the market value of inventory during the period it is held. One way to do that is to take equal and opposite stands in the futures market and the cash market. This practice has been termed "locking in" a desired price.

While hedging is a useful tool to help minimize risk, it is not the only answer to all pricing difficulties. Futures–based risk management does not guarantee higher prices for producers or processors. While hedging may lead to higher–than–market prices, it may also lead to lower–than–market prices. Remember, hedging "locks in" a price, which may or may not turn out to be higher than the cash market price.

What, then, is speculating? As elementary as it may sound, speculating is the opposite of hedging. In one sense, a speculator is someone who lets the market determine whether or not money will be made on held inventory. Put another way, any firm holding inventory without the protection of futures contracts is speculating that the value of the inventory will remain the same or increase. Speculating can also be accomplished without any inventory at all. In this regard, a speculator makes money by buying and selling futures contracts; a speculator may move into and out of several positions every day in an attempt to make profits.

With a hedging strategy, the producer takes a position in the futures market that is equal and opposite to the position taken in the cash market. A dairy producer who plans to ***sell*** milk at a future date and plans to ***buy*** futures contracts for the same time period is hedging. The position in the cash market is plain to see — the producer sells the milk that is produced. The futures position may not be quite as easy to understand. In order to get in and out of the futures market, the producer must offset any position taken. For example, a producer who ***buys*** a futures contract for 200,000 pounds of Class III milk with a December delivery date must at some point before December ***sell*** a futures contract for 200,000 pounds of Class III milk with a December delivery date. The opposite position cancels the producer's position, and no actual delivery must be made.

III. d. Options: What they are and how they work

An option is a contract between two parties which gives the buyer the right (but not the obligation) to sell or buy a specified commodity at an agreed upon price during a known time period. Options give the buyer more flexibility than futures contracts. The two types of options are ***puts*** and ***calls***. In addition, there are two "players" in options — buyers and sellers. The financial obligations are different (asymmetric) for buyers and sellers of options,

analogous to the different financial obligations for insurance companies and consumers interested in obtaining insurance policies.

Puts give the buyer the right (but not the obligation) ***to sell*** a futures contract, and calls give the buyer the right (but not the obligation) ***to buy*** a futures contract. Puts are the most relevant type of option for producers because producers want to protect against downward price movements, i.e., puts provide protection against falling prices. Should the milk price decrease, producers with put options have the right to sell a futures contract at a pre–determined price. On the other hand, call options are the most relevant type of option for processors because processors want to protect against upward price movements, i.e., calls provide protection against rising prices. Should the milk price increase, processors with call options have the right to buy a futures contract at a pre–determined price.

To obtain a put option, a premium is required, similar to the way that insurance policies require premiums for coverage. Furthermore, the amount of the premium varies with the price at which the futures contract transaction will be exercised, called the "strike price". Larger premiums must be paid to obtain put options with high strike prices. For example, a producer should expect to pay more for a put option for Class III futures with a $15.00/cwt. strike price than a put option with a $12.00.cwt. strike price, all other factors being equal. Furthermore, the further away the exercise date, the more expensive the premium, the idea being that there may be more opportunities to have unexpected price movements.

A distinction should be made between the above descriptions that pertain to ***option buyers*** and an ***option seller***. A seller of options essentially takes on the role of an insurance company in which the maximum gain is the sum of the premiums collected from the option buyers. However, the maximum loss is unlimited. In general, producers should not try to sell options to other parties because of the potential losses incurred should the price move against the seller. This type of strategy is effective only when prices are stable (flat).

III. e. Swaps

Swaps are yet another tool for managing risk. Remember that in the futures market it does not matter who sells a contract to a buyer because buyers and sellers are not matched up directly. Also, the exchange serves as the clearing house and as the guarantor of all contracts. In contrast, with swaps, there is a direct interaction of buyers and sellers, but no brokers and no clearing house. Simply, a swap is a contractual agreement in which two parties agree to make periodic exchanges with each other. Contained in the written agreement is a specification of the product to be exchanged, the timetable for payments and any other provisions necessary. Swaps allow a more tailored arrangement than can be made with the futures market alone, and as such, risk associated with location, timing, quantity, etc. can be virtually eliminated.

An example will help to illustrate how a swap can work. An ice cream manufacturer wants to secure butter at $1.25 per pound for an extended period of time on 100,000 pounds per month. To engage in a swap, the ice cream manufacturer must find a partner willing to "sell" butter at $1.25 and buy it back at the CME market price each week. The other partner does not have to actually make butter; butter can be bought through the exchange at the cash market price. The "supplier" is gambling that the market price will be, on average, less than the fixed price of $1.25 per pound for the duration of the agreement. For every month the supplier is correct, he collects a premium equal to the difference between the market price and $1.25 multiplied by 100,000 pounds.

Price alignment affects the flow of payments. When the market price is lower than the agreed upon price of $1.25 per pound, the ice cream manufacturer is still committed to the $1.25 per pound price. In this case, the ice cream manufacturer must make payments equal to the difference between $1.25 per pound and the market price multiplied by 100,000 to the engaging party ("supplier"). Even though the market price for butter is less than $1.25 per pound, the ice cream manufacturer must pay a total of $1.25 per pound — a portion of it goes directly to purchase butter and a portion goes directly to the supplier per the agreement.

When the fixed price is lower than the market price, the ice cream manufacturer still gets the fixed price of $1.25 per pound. However, the "supplier" now makes payments to the ice cream manufacturer equal to the difference between the market price and $1.25 per pound multiplied by 100,000 pounds.

IV. Dairy Options Pilot Program

The Federal Agricultural Improvement and Reform Act of 1996 recognized that risk management has a place in the world of dairy transactions. In an attempt to encourage dairy producers to participate in programs that stabilize milk prices, the Act authorized a pilot program to facilitate the introduction of options as a management tool for dairy producers. The Dairy Options Pilot Program (DOPP), administered by the Risk Management Agency of USDA, commenced in January 1999 and runs until December 2002. The objective of the pilot program is to determine whether futures market options can provide producers with acceptable price risk protection.

As discussed above, put options are a kind of price insurance. Producers pay a premium to obtain the option, which in turn, give producers the right but not the obligation to sell a futures contract at a specified price. This mechanism serves to provide a floor on the producers' milk price. The floor can be established at a level of the producers' choosing, but producers will pay higher premiums for higher guaranteed prices.

The DOPP is structured as a voluntary cost–sharing agreement between participants and USDA by giving producers in selected counties across the U.S. a financial incentive to use options to manage price risk. USDA provides training sessions to potential participants, 80 percent of premium cost of any options purchased and up to $30 for the transaction costs (broker fees). The DOPP has several rules that dictate how the program can be used. First, no more than 200,000 pounds of milk can be hedged in any single expiration month. Second, producers can hedge a maximum of 600,000 pounds of milk during the 12–month period of activity, but cannot hedge more than their actual milk production. The 600,000 lb maximum is approximately equal to production from 35 to 45 cows. Third, up to 100 producers in a single selected county can participate. Fourth, each round lasts 12 months. Last, the program is structured as a short–term program. While producers may participate in DOPP up to three times, it is meant to provide a low–cost opportunity for producers to get experience using options.

Two full rounds of the DOPP have been completed, and a third round of eligible counties was announced in the fall of 2001. In total, 300 counties in 39 states have been able to participate in the DOPP. After the first two rounds, 850 producers in 74 counties had purchased about 3,500 put options.

V. Dairy Forward Pricing Pilot Program

In keeping with the themes of market orientation and price stabilization as advocated by the FAIR Act, Congress authorized a cash forward contracting pilot program. The Dairy Forward Pricing Pilot Program (DFPPP) was established by an amendment in November 1999 to the Agricultural Marketing Agreement of 1937. The DFPPP became effective in August 2000 and expires December 31, 2004. Not to be confused with the DOPP, which encourages dairy producers to purchase and use options and the futures market, the DFPPP provides a means for direct dairy processor to dairy producer transactions.

Forward contracting represents a significant departure from the closely monitored milk pricing prevalent in regulated milk markets. Participating producers may receive, at times, prices that are below the announced minimum class prices for the marketing order. As such, the pilot program comes with a number of safeguards to facilitate the introduction of the program. First, any contract must be limited to Classes II, III and IV. Class I milk, or milk used for fluid purposes, is specifically excluded from any forward contracting arrangements. Second, a plant may not contract any milk in excess of its usage of Classes II, III and IV. Third, participating producers must sign a disclosure statement that must be filed with the marketing order administrator. The purpose of the disclosure statement is to acknowledge that a participating producer may receive a price for his or her that is less than the minimum price. Fourth, the first contract entered into must be no longer than

12 months; the duration of subsequent contracts is not limited. Fifth, contracts must be submitted to the office of the market administrator that regulates the milk. The market administrators are required to check the contracts for completeness and compliance with regulations, and they will enforce payment dates. They will not, however, enforce prices or terms of the contract. Sixth, there is no limit to how much milk each farmer can contract; participants can contract 100 percent of the milk they produce. Finally, the basis for contract pricing does not have to match pricing mechanism within the marketing order. For example, processors who are pooled in a marketing order that has component pricing can offer contracts featuring hundredweight pricing.

From a pool handler's viewpoint, the program does not add or subtract from the current workings of the regulated pricing system. Under DFPPP, participating handlers must account to the pool for any milk under contract at the order's minimum class prices. These handlers may continue to pay into or draw from the pool, as they would without the DFPPP. For example, pooled cheese plants would normally have a pool draw because the Class III price is almost always lower than the order's blend price. This payment and credit feature does not alter the value of the pool if the plant was historically a pool plant. If the plant was not a pool plant and then becomes one when engaging in forward contracts, there may be an additional draw from the pool that would not have occurred without the program. The program also permits simultaneous depooling and forward contracting, i.e., a plant can be pooled for the milk under contract and not pooled for the milk not under contract.

In the final rule for the DFPPP, USDA noted that some forward contracting was done prior to pilot program by cooperatives and plants that are not pooled in any federal order. Cheese plants in Idaho have long exercised the option to not be pooled. As such, those plants have been able to offer forward contracts to dairy producers who ship milk to the plants. USDA was careful to note that the regulations do not affect the ability of cooperatives to forward contract with members, but neither USDA nor the individual marketing order administrators would monitor any such arrangements.

VI. Summary of Forward Contracting Activity in Federal Orders

VI. a. Introduction

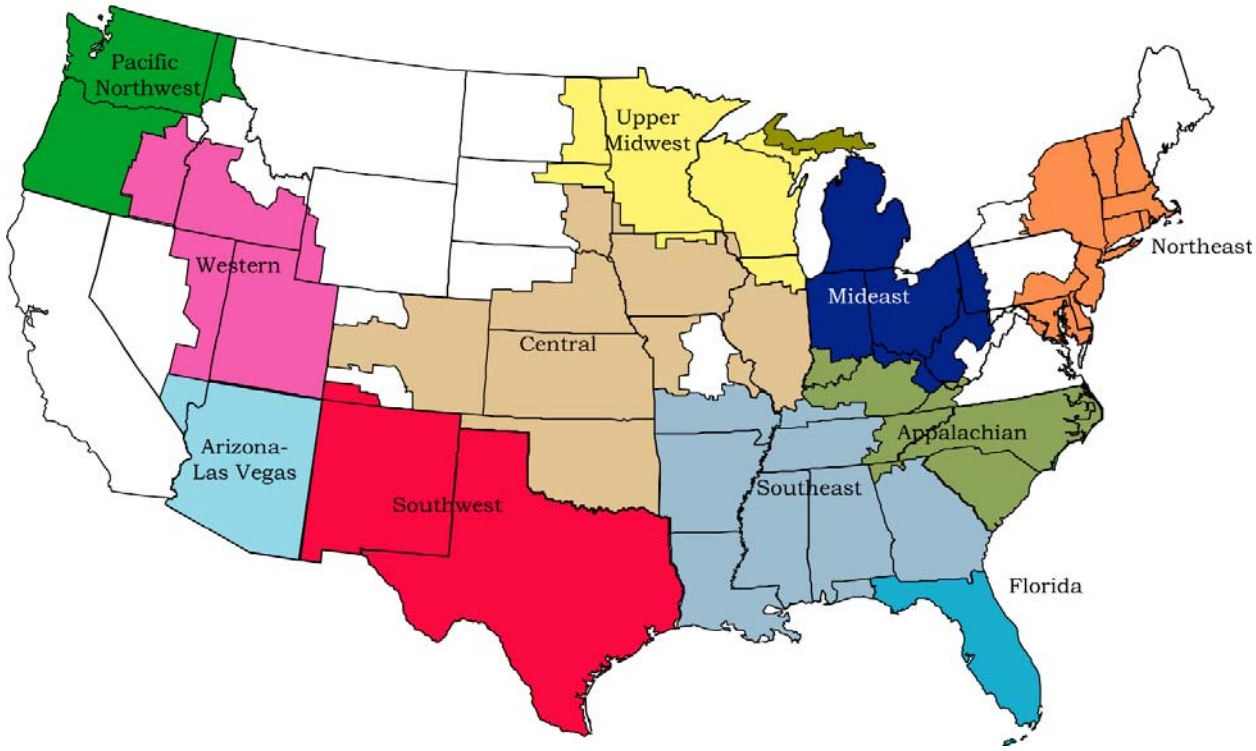
As noted in the final rule, part of USDA's responsibility in administering the DFPPP is to conduct a study to determine the impact on milk prices paid to producers in the U.S. In order to complete such a study, USDA will need to review, summarize and evaluate the different types of contracts that are administered under the auspices of the pilot program. The study was originally scheduled to be submitted to Congress no later than April 30, 2002. In this vein, USDA had planned to mail out questionnaires to capture some of the ancillary information needed, such as amount of milk produced or processed

during a typical month, number of milk buyers, reasons for entering into forward contracts, how contract prices were negotiated and whether or not the experience was beneficial. Because of the anthrax scare in fall of 2001, the questionnaires were not mailed out. In fact, the mailings have been delayed until April 2002 with the report due date moved back to October 2002. Senate Bill 870 suggests an area for review and analysis that depends on information that would have been published in the results of USDA's own study. Without access to the report or to the specific contract data submitted to USDA, the impact on producer prices and the pooling programs in the individual federal markets cannot be ascertained. To address some of the questions regarding the use of forward contracting in federal orders, the 11 market administrators were contacted and interviewed individually.

VI. b. Individual Order Reports on Forward Contracting

USDA regulates 11 milk marketing areas (Figure 1). The Upper Midwest has had the most participation in terms of number of the forward contracts exercised. Four of the orders — Southwest, Appalachian, Arizona – Las Vegas and Pacific Northwest — have not had any contracts submitted to the respective market administrators' offices. The market administrators monitor only contracts with eligible producers. That is to say, only contracts involving

Figure 1. Location of 11 Federal Milk Marketing Orders



non–cooperative members are collected and reviewed. Cooperative members are free to engage in similar arrangements with their cooperative, but these contracts are not reviewed by the market administrators.

VI. c. General Comments That Apply to All Orders

Forward contracts tend to be specific to the offering handler in many regards, from the complexity of the document signed to the actual working details of the contracts. For example, contracts may range from one page to 10 pages in length. Shorter contracts are typically vague on the details of dispute resolution, e.g., what happens when milk deliveries cannot be made or the milk delivered doesn't meet contract specifications. Duration of the agreement is variable, but six and 12–month arrangements seem to be the most common. In all cases, a plant's pool draw, should one exist, is included as part of the contract. Because of the pricing structure, cheese plants will nearly always have a draw from the pool; without exception, these monies are passed onto producers. Participation in 2002 has dropped off severely from 2001. In two of the marketing areas, the number of participating producers in 2002 was less than 10 percent of what they were in 2001. The general sentiment for the decrease in participation rate is that, in hindsight, contract prices were well below market prices. Dairy producers voiced concern that they had "left too much money on the table" in the middle and toward the end of 2001. One interviewee estimated that 15 percent to 25 percent of the market price was left on the table for several months during 2001.

VI. d. Upper Midwest

About 1,100 of 6,000 eligible producers and 10 handlers have participated in forward contracts since August 2000. To this point, all contracts have been between producers and cheese plants. Milk under contract may be on a pounds basis every month or by a percentage of a historical production base. Most contracts range from 50 to 90 percent of a production base. In some cases, the contracts specify that the buying handler must receive all milk produced by the participants, even if the milk is not under contract. While varied, contracts that are based on pounds of milk are offered in 10,000 pound increments.

Contracts may specify fixed prices on individual component (fat, protein, solids–not–fat and other solids) or a simple, fixed hundredweight price. In all contracts submitted, premiums, such as volume premiums and quality premiums, have been included as part of the contract.

VI. e. Western

About 20 contracts per month, all cheese–based, have been submitted since August 2000. Contracts have specified a fixed quantity of milk and a fixed price per hundredweight, which is adjusted for component levels if they are

above the minimum specified in the contract. No producer has all of his or her milk under contract in the marketing order. Processing plants do not require that all of a dairy's monthly production be received into the contracting plant, as was the case with some plants in the Upper Midwest Order.

VI. f. Mideast

Forward contracting has not been overly popular in the Mideast Order. Participation ranges from about 200 to 350 producers (six to nine percent of the eligible producers). All contracts have involved cheese plants. Participating producers tend to be the smaller farms in the marketing order. Producers who have entered forward contracting agreements do not contract for all of the milk they produce. To date, no more than 80 percent of any farm's production has been under contract.

Contracts seem to be mainly component–based contracts in which producers negotiate for fixed prices on components and a fixed number of pounds of components to be delivered. Like the Upper Midwest Order, some processors require delivery of all milk produced from a dairy, including that which is not under contract. Premiums are not usually specified within the contracts themselves, but those payments may occur outside of the bounds of the contracts. Contracts usually specify a penalty for coming up short on delivery — the producer will receive the lesser of the Class III price or the contract price for all milk received for that month.

VI. g. Central

The Central Order is the only marketing area to have forward contracts offered by processors other than cheese processors. While cheese processors have offered most of the contracts, some ice cream plants have also offered contracts to producers. About 100 producers have entered into forward contracts since the pilot program was approved. The structure of contracts varies widely, especially with pricing. As with the other orders, contract pricing is either a fixed price per hundredweight of milk or fixed prices per pound on milk components. Some contracts offer one set price for 12 months; others are far more flexible with prices by allowing for the same premium schedule as is available for producers who are not under contract. Contract offerings change every month. Some processors have notified producers of their intent to offer a contract several months in advance; producers are given the details of the contract well in advance of the contract start day to assist in the decision–making process. Some processors have allowed producers to sign up for several contracts at different price over a period of months. For example, a producer could commit 10 percent of his or her milk production per month for up to eight months.

VI. h. Southeast and Florida

Of the marketing orders that have forward contracting, the Southeast and Florida have the lowest participation rates. Only about 12 contracts have been accepted in 2000 and in 2001. Approximately 1,000 producers would be considered eligible between the two orders. All contracts have been offered by cheese processors and have been fat– and skim–based only. Premiums are not typically specified in the contracts that have been offered.

VI. i. Northeast

Like the Southeast and Florida Orders, participation in the pilot program in the Northeast has been rather low. In 2001, only one handler, a cheese processor, offered contracts; 35 producers accepted the contracts. Thus far in 2002, only one producer is under contract. The pricing terms of the contract have been fixed component prices for the duration of the contract. Other premiums have been offered for quality. Most of the contracts covered 50 to 100 percent of the milk produced on a farm. In contrast to the Mideast Order, participating producers tend to operate larger–than–average farms.

VII. Federal Order Forward Contracting Example

Contract specific data was not available from USDA prior to the writing of this report. However, enough data from contracts offered in the Upper Midwest, Central and Western Orders were collected to put together a reasonable example of a how a forward contract might appear to the two parties involved. This example assumes a 12–month contract with fixed prices on components — fat, protein and other solids are valued at $1.50, $1.90 and $0.14 per pound, respectively. To make a meaningful comparison, the price paid to the producer must include not only the base price established by the contract but the producer price differential (PPD) as well. The PPD represents the difference between the Class III price and uniform price for the order. As noted above, plants have passed along this money to the contracting producers. To complete the assumptions needed for this example, an average–sized Idaho dairy farm ships to a pooled cheese plant regulated under the Western Order. The Class III price, the PPD and the uniform price (Class III plus the PPD) are actual data that applied to the Western Order in 2001 (Table 1). The contract price is arrived at by multiplying the component prices by the assumed content of the milk and using the federal milk marketing order approach to combining the fat value with the sum of the nonfat values. A fat content of 3.5 percent fat is used; the skim portion of the milk assumes 3.1 percent protein and 5.9 percent other solids.

While the example is merely hypothetical, it does demonstrate a predictable characteristic of forward contracting — in some months, the producer under contract fares better than the non–contracting producer, and in other months, the non–contracting producer fares better. Initially, the producer pay price

exceeds the uniform price. This seems to be a commonality among forward contracts, and rightfully so. It would be difficult to attract interested producers if they were assured a lower price than a speculating producer in the very first month. The results also show that the producer usually receives at least the base price established by the contract. Note that in this example, a strong Class III price from May through September necessarily decreases the PPD. In October, the negative PPD actually takes money away from the producer pay price rather than enhancing it.

Table 1. Impact of Forward Contracting Agreement on Producer and Processor
Prices are in dollars per hundredweight

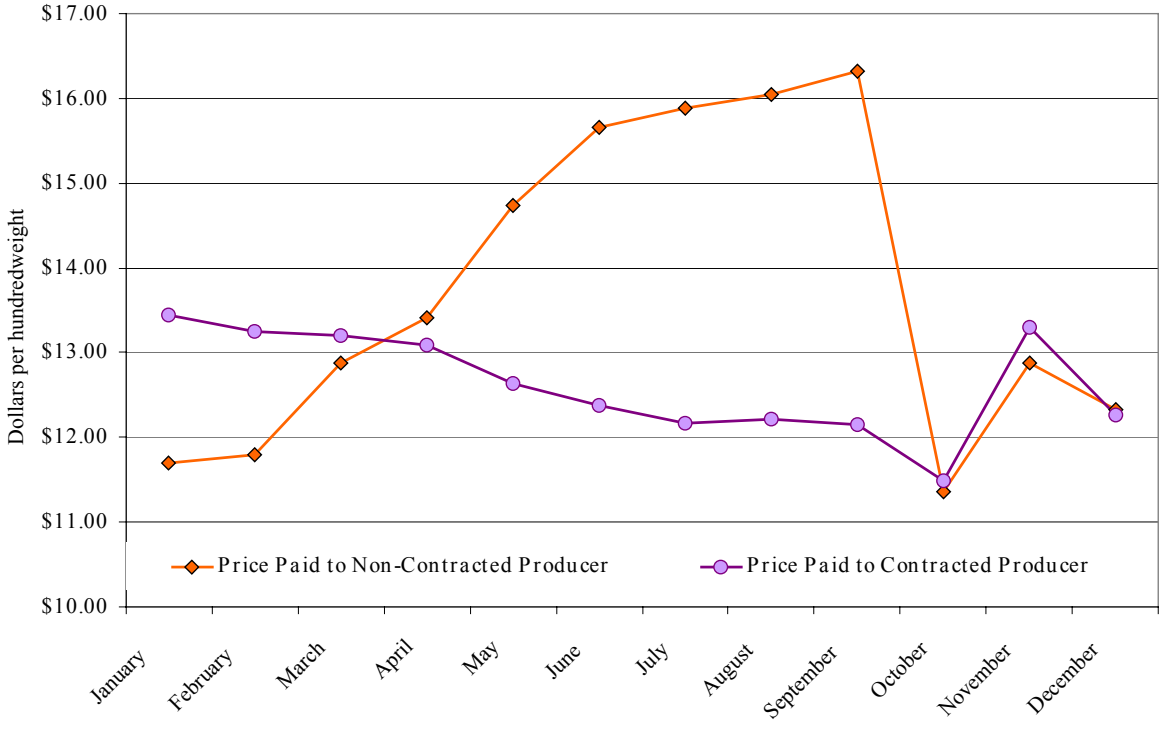
	Class III	Producer Price Differential	Uniform Price	Price Paid to Contracting Producer	Price Paid to Contracting Producer less Uniform
January, 2001	$9.99	$1.71	$11.70	$13.44	$1.74
February	$10.27	$1.52	$11.79	$13.25	$1.46
March	$11.41	$1.47	$12.88	$13.20	$0.32
April	$12.05	$1.35	$13.40	$13.08	($0.32)
May	$13.83	$0.91	$14.74	$12.64	($2.10)
June	$15.02	$0.65	$15.67	$12.38	($3.29)
July	$15.45	$0.44	$15.89	$12.17	($3.72)
August	$15.55	$0.49	$16.04	$12.22	($3.82)
September	$15.90	$0.42	$16.32	$12.15	($4.17)
October	$11.61	($0.25)	$11.36	$11.48	$0.12
November	$11.31	$1.56	$12.87	$13.29	$0.42
December	$11.79	$0.53	$12.32	$12.26	($0.06)
Average	*$12.85*	*$0.90*	*$13.75*	*$12.63*	($1.12)

For this small example, it is instructive to compare the contract price with that received by a non–contracting producer (i.e., a speculating producer). Granted, such a comparison ignores the purpose of forward contracting, that is, to stabilize milk prices. However, interviews with the individual market administrators confirmed that producers use this type of comparison most often to evaluate the success of the forward contract; producers want to know "how well they did" in making the decision to enter the agreement.

The speculating producer receives the uniform price each month, which starts off considerably lower than the contract price (Table 1). Toward the summer and fall months, this trend reverses, and the speculating producer actually receives a considerably higher price than the forward contracting producer.

When the Class III price falls drastically from September to October, the gap between a speculating producer and the forward contracting producer narrows considerably. On average for the 12 months, the speculating producer actually would have received over $1.00 per hundredweight more than the forward contracting producer. As suggested previously, some producers are inclined to measure their success in forward contracting by comparing their gross revenue to that which would have been generated without the contract. However, the underlying purpose of forward contracting is to stabilize prices. At least for this example, the forward contracting producer would have realized considerably more stable prices (Figure 2).

Figure 2. Comparison of Forward Contracted Price with Uniform Price
Western Order, 2001



Clearly, this example is not exhaustive, nor is it meant to be. Different assumptions and different price data would lead to different results. Notwithstanding this, several points are illustrated. First, the potential exists for participating producers to receive less than the uniform price and even less than the contract base price. The reverse is also true. Second, forward contracting arrangements do not, by themselves, guarantee more revenue for producers. Third, producers who are considering a forward contracting arrangements should be familiar with his or her own costs and know at what level the contract price will assure an adequate profit for the operation.

VIII. Forward Contracting Programs Offered by Cooperatives

Three dairy cooperatives were interviewed to ascertain the types of forward contracting arrangements made available by the cooperatives to their producer–members. Two of the cooperatives have members both within and outside of California; the third cooperative operates regionally in Northeastern state only. While California has several dairy cooperatives, only the two national cooperatives have offered forward contracting programs in California. When questioned about its reluctance to offer any forward contracting programs, one cooperative responded that none of its members had requested such programs, and thus, they saw no need to develop, coordinate and administer those programs internally.

VIII. a. Cooperative A

One national cooperative has two programs operating, both of which run internally. The first program has been operational for three years and is based off a fixed cheese price. The mechanics are quite simple — the cooperative notifies producers that a long–term sale of bulk cheese has been arranged and offers its producer–members an equivalent milk price for 12–months based on the fixed cheese price. Producer–members may be required to commit a minimum level of milk production to the venture, say 10,000 to 20,000 pounds of milk per month. They may also be restricted on how much milk they can commit to the forward contract. The maximum is typically a percentage based on the previous year's production. Producer–members decision whether or not to enter the contract must be made within seven to 10 days of notification. If the total volume of milk committed by all interested producer–members exceeds the agreement with the end product buyer, all interested participants will have their committed volumes prorated accordingly.

Insofar as pricing is concerned, the cooperative adds to or deducts from the participants' milk checks so that the fixed price is exactly the amount agreed to, less a $0.10 per hundredweight charge to administer the program. For example, if the fixed price offered to the producer–members is $1.35 per pound, and the average market price for cheese for the month is $1.45 per pound, then the participants' milk checks will reflect a deduction of 10 times the difference between the contract price and average market price. The multiple of 10 is to convert from a cheese price to a milk price, i.e., processors can produce 10 pounds of cheese from 100 pounds of milk. The deduction is this case brings the contracting producer down to the agreed upon price, less the administrative cost charged by the cooperative. If the average market price for cheese was lower than the contract price, the cooperative would add money to the participants' milk check. This type customer–based contracting can also be accomplished with butter and nonfat dry milk using the exact same mechanics.

The cooperative's second program offers a fixed Federal Order Class III price to producer–members. In this program, there is no end product buyer. Instead, the cooperative hedges the offering by offsetting the producer–members' positions in the futures market. Again, the cooperative requires a minimum volume commitment; in this case, 25,000 pounds of milk is the least that can be contracted by interested producer–members. To administer the program and to reduce some of the cooperative's exposure to price risk, the cooperative charges participants $0.10 per hundredweight. This program is geared toward producer–members who operate in federally regulated markets and who are familiar with Class III prices. The difference in pricing between California and federal orders has prompted the cooperative to consider offering overbase contracts to California producer–members so that a familiar pricing element can be referenced. This will present a challenge for the cooperative because the futures market only has contracts available based on federal milk pricing. As such, the cooperative will be attempting to offset pricing positions based on the California overbase price with contracts that are based on federal milk prices. About 100 million pounds of milk, which is just over one percent of the total milk marketed by the cooperative in the U.S., has been covered by this program.

The level of participation in California for customer–based contracts has dropped since 2000. In 2000, the cooperative offered two such contracts, which resulted in 16 percent of cooperative's California milk being under contract. In 2001, eight cheese contracts were offered with durations of six, nine and 12–months. While only 14 percent of the cooperative's milk was under contract, about 45 percent of the producer–members participated at some level. Six contracts have been offered in 2002, but in two cases, no producers committed any milk to the program. Thus far in 2002, five percent of the cooperative's milk is under contract with 11 percent of the producer–members participating at some level.

VIII. b. Cooperative B

The second cooperative interviewed, also national in scope, has offered internally managed contracts since 1999. Milk volume and contract numbers greatly increased from 1999 to 2001, reached a high point during the summer months of 2001, and have decreased since then. Producer–members who are interested in engaging in forward contracting must sign a master agreement prior to enrollment. The master agreement acknowledges the potential for lower than minimum prices for participants but does not actually enroll a producer in any kind of contract. The contracts are based on the announced Class III and IV prices that apply to federal milk marketing orders. Milk checks are adjusted by the difference between the contract price and announced price and multiplied by volume. As with the other cooperative programs, the cooperative will add to or deduct from the producer–members' milk checks, depending on the relationship of the contract price with the announced class price. Contracts require a minimum of 20,000 pounds of milk and move up in

increments of 5,000 pounds. Producer–members may contract up to 50 percent of their monthly production and have multiple contracts in a single month for differing volumes and prices. Contract length can vary from one to twelve months. For this cooperative, as much as 155 million pounds has been contracted in any one month (about five percent of milk marketed by the cooperative in the U.S.), but 90 million pounds appears to be a better representation of ongoing forward contracting activity. In any one month, less than two percent of the membership is participating in the program. None of the cooperative's California membership is participating in the forward contracting programs currently.

VIII. c. Cooperative C

The third cooperative interviewed operates exclusively in Northeastern states and offers two different types of programs to manage risk — forward contracting and milk price stabilization (income smoothing). Unlike the previous two cooperatives, this cooperative merely facilitates the programs and does not actually bear any of the risk of the programs.

The forward contracting program uses either the futures market to offset the position taken by the producer or a customer–based contract, in which a buyer has been lined up to purchase cheese or another dairy commodity at a fixed price. In either case, once the contracts are established, they are binding on the producer–members. With customer–based contracts, prices are negotiated directly with the customer. These arrangements are made with non–pool plants or another dairy cooperative to avoid any minimum price violations. The cooperative has also been successful in engaging in swaps with customers using butter and cheese to get fixed prices for their producer–members. For contracts based on the futures market, producers only need to commit as little as 20,000 pounds per month through the cooperative's program, whereas producers who engage directly in the futures market must commit a minimum of 200,000 pounds.

Producer–members cannot contract more than 80 percent of previous year's production. For its part, the cooperative takes care of all arrangements; the producer–members only see adjustments in their milk checks. Approximately 10 percent of membership and 10 percent of the cooperative's milk is participating in these two risk management alternatives at some level.

The second program offered by the cooperative attempts to stabilize a producer's income by holding back or paying forward monies owed to the producer. This program assists producers who might encounter cash flow difficulties stemming from erratic market prices. Producer–members must enroll in program for 12 months at a time. Once committed to the program, the cooperative determines a stable target price for each producer–member depending on farm location, farm size and milk quality and on internal forecasts for milk prices. Once initiated, the cooperative pays participants their

pre–determined price every month. When the market price increases above the target level, the cooperative deducts money from the producer–members' milk checks. Conversely, when the market price decreases below the target level, the cooperative adds money from the producer–members' milk checks. At the end of the 12–month period, the cooperative settles with participants based on what they would have received if they had not participated in the program. If target price leaves the producer–members short, then the cooperative makes a lump sum settlement payment to the dairies. If the program, instead, enhances revenue beyond what the producer–members would have received they not participated, then cooperative deducts the difference from their milk checks. If the difference is a large amount, then the participants can spread the repayment over several months. About 10 percent of the producer–members per year participate in the income smoothing program.

IX. Proposals for Forward Contracting in California

IX. a. Forward Contracting Operating Within the Pool

Thus far, only one proposal for forward contracting in California has been formalized. In spring of 2000, Senate Bill 1773 was introduced by Senator Kelley and sponsored by the Dairy Institute of California. Two primary objectives of this forward contracting program were to protect the integrity of the pool of revenues from milk sales and to work within the minimum class price framework established by the State. To expand on the first objective, if the forward contracting program operated outside of the pool such that processors did not pay into the pool or draw money from the pool, then value of the pool would be affected. In other words, the price received by non–participating producers would be impacted by forward contracts that operate outside of the auspices of the pool. Regarding the second objective, state law requires that all Grade A handlers in California pay no less than the announced minimum class prices for milk based on usage. Notwithstanding these two objectives, an amendment to the Milk Pooling Plan would still be necessary to allow the processors to pay producers less than the announced pool prices for milk received.

By design, the proposed forward contracting arrangement would have accomplished its two objectives, i.e., the integrity of the pool would have been protected (and the prices received by non–participants would be unaffected) and handlers would continue to pay at least the minimum announced class prices for milk. However, in the process of accomplishing these objectives, a significant sacrifice has to be made in the way the program works. In this case, the producer who participates in the program realizes the sacrifice, which may result in either a loss or a gain to the producer. According to the proposed language, the handler pays to a participating producer a price based upon the individual producer's quota and overbase marketings adjusted by the difference between the contract price and the handler's obligation to the pool. Under this arrangement, the handler is assured of a long–term, fixed raw product cost for

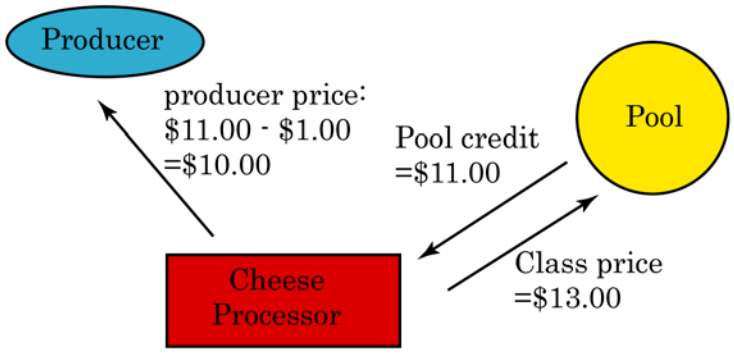
the milk under contract, and the producer under contract is left to bear all of the risk of price increases and decreases**.** The sacrifice alluded to is the volatility of the producer's revenue stream, which will fluctuate every month. The reason is because the producer's price is an adjusted price and not a fixed price. At face value, it may seem perfectly reasonable to presume that a program could be developed such that the producer and the processor can get fixed prices **and** still have the program operate within the pool. This presumption would be incorrect. The volatile nature of the pool of revenues, a result of changes in minimum class prices and plant usage, assures that some party or parties will have to bear that volatility.

Two examples will illustrate how Senator Kelley's proposed forward contracting program would work. If the contract price is less than the minimum class price, the producer receives the pool price **minus** the difference between the contract price and the class price (Figure 3). If the contract price is higher than the class price, the producer receives the pool price **plus** the difference between the contract price and the class price (Figure 4). While it may be a debatable point and subject to interpretation, Figure 3 shows a potential violation of minimum class prices in that the adjustment that the producer receives is kept by the handler. As such, some may interpret this withholding as a raw product advantage compared to non–contracting handlers.

Figure 3: Contract Price Lower Than Class Price

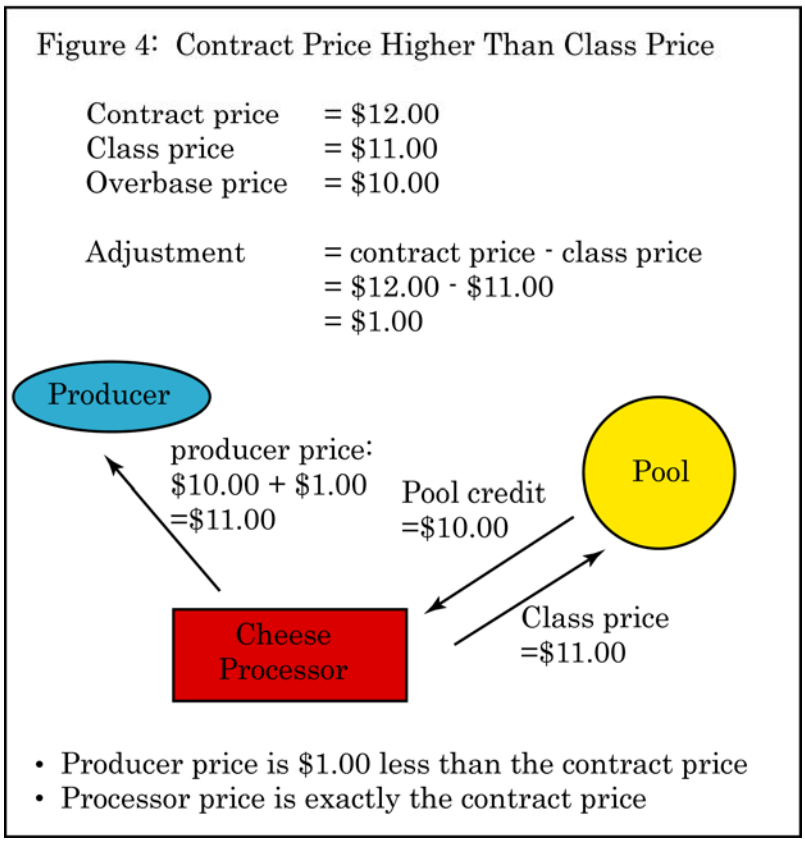
Contract price = $12.00
Class price = $13.00
Overbase price = $11.00

Adjustment = contract price - class price
= $12.00 - $13.00
= -$1.00



- Producer price is $2.00 less than the contract price
- Processor price is exactly the contract price

Figures 3 and 4 are very elementary representations and show only the mechanics of how money passes between producer, processor and the pool. Tables 2 and 3 and Figures 5 and 6 illustrate the impact of forward contracting on the producers and processor involved in the arrangement using actual price data from 2000 and 2001. For simplicity, the example assumes that a cheese plant is engaged in forward contracting with a group of 100 percent overbase producers (i.e., the producers own no quota).



Actual overbase and Class 4b prices from 2000 and 2001 and 12–month durations are used in the calculations. The contract prices represent the equivalent of $1.25 and $1.33 per pound for cheese for 2000 and 2001, respectively. These prices are chosen using historical offerings from processors engaged in forward contracting and the market price for cheese at the beginning of the 12–month period as guidelines.

While the examples tend toward the simplistic, they both demonstrate a few basic principles. First, the processor who forward contracts can expect to pay a fixed price for milk, as a forward contracting arrangement is supposed to provide. In Figures 5 and 6, the processor's price is exactly equal to the contract price — $10.75 in 2000 and $11.75 in 2001. Second, the producer who enters into a forward contract does not receive the contract price. Figures 5 and 6 give two contrasting examples in this regard. In 11 of the months in 2000, the forward–contracting producers would have received more than the overbase price, and in every month, the producers receive more than the contract price. The 2001 data show a very different result, in which producers would have received less than the overbase price in seven of the 12 months, and less than the contract price in five of the twelve months. It should be clear from these examples that it is nothing more than a coincidence when a forward–contracting producer receives the contract price. In these particular examples, the producers engaged in the forward contracting agreement would have fared better than the contract price on average — by $1.07 per hundredweight in 2000 and by $0.50 per hundredweight in 2001 (Tables 2 and 3). Comparing the pay price to the overbase price yields different results. Producers engaged in forward contracting agreements in 2000 would have fared better than the overbase price by $1.06 per hundredweight but worse in 2001 by $1.16 per hundredweight.

Table 2. Example of Forward Contracting in California Using 2000 Data
Prices represent dollars per hundredweight

	Overbase	Class 4b	Contract	Deduction or Addition	Producer Price	Producer Price Less Overbase	Producer Price Less Contract
January	$10.05	$9.58	$10.75	$1.17	$11.22	$1.17	$0.47
February	$9.95	$9.28	$10.75	$1.47	$11.42	$1.47	$0.67
March	$10.03	$9.34	$10.75	$1.41	$11.44	$1.41	$0.69
April	$10.36	$9.27	$10.75	$1.48	$11.84	$1.48	$1.09
May	$10.54	$9.17	$10.75	$1.58	$12.12	$1.58	$1.37
June	$11.08	$9.98	$10.75	$0.77	$11.85	$0.77	$1.10
July	$11.30	$10.64	$10.75	$0.11	$11.41	$0.11	$0.66
August	$11.32	$10.57	$10.75	$0.18	$11.50	$0.18	$0.75
September	$11.61	$11.32	$10.75	($0.57)	$11.04	($0.57)	$0.29
October	$10.59	$9.01	$10.75	$1.74	$12.33	$1.74	$1.58
November	$10.99	$8.71	$10.75	$2.04	$13.03	$2.04	$2.28
December	$11.28	$9.39	$10.75	$1.36	$12.64	$1.36	$1.89
Averages	*$10.76*	*$9.69*	*$10.75*	*$1.06*	*$11.82*	*$1.06*	*$1.07*

Figure 5. Example of Proposed Forward Contracting in California, 2000

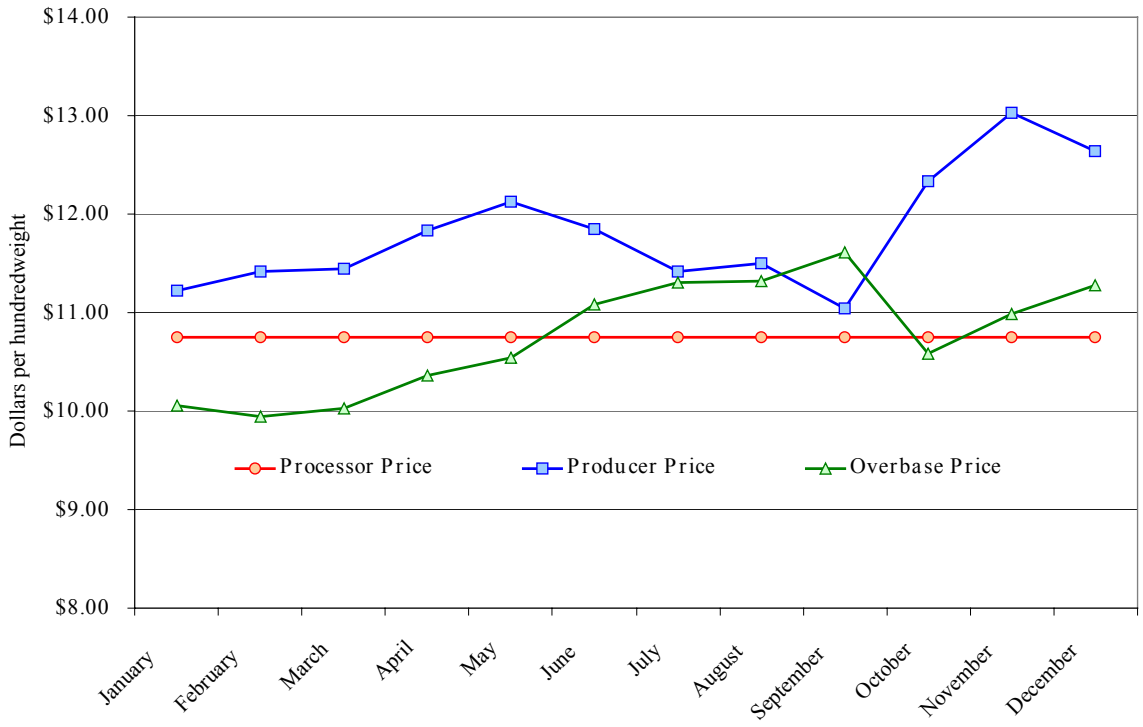
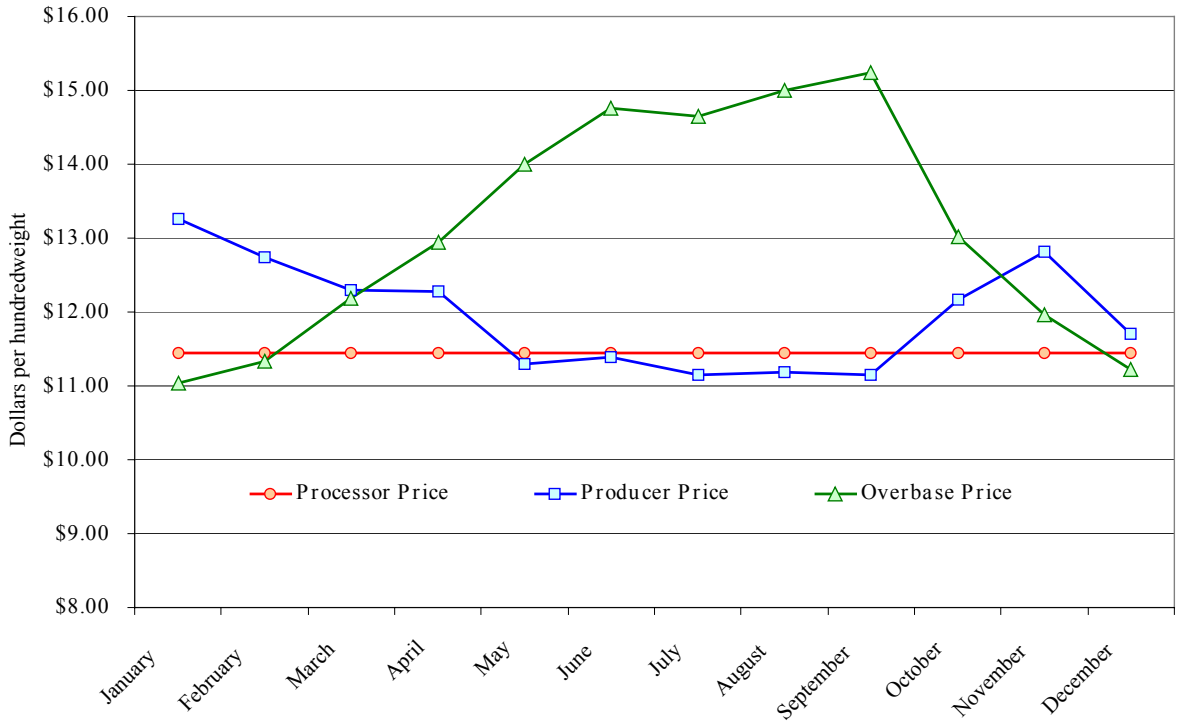


Table 3. Example of Forward Contracting in California Using 2001 Data
Prices represent dollars per hundredweight

	Overbase	Class 4b	Contract	Deduction or Addition	Producer Price	Producer Price Less Overbase	Producer Price Less Contract
January	$11.03	$9.22	$11.45	$2.23	$13.26	$2.23	$1.81
February	$11.34	$10.05	$11.45	$1.40	$12.74	$1.40	$1.29
March	$12.18	$11.34	$11.45	$0.11	$12.29	$0.11	$0.84
April	$12.95	$12.12	$11.45	($0.67)	$12.28	($0.67)	$0.83
May	$14.00	$14.16	$11.45	($2.71)	$11.29	($2.71)	($0.16)
June	$14.76	$14.82	$11.45	($3.37)	$11.39	($3.37)	($0.06)
July	$14.65	$14.96	$11.45	($3.51)	$11.14	($3.51)	($0.31)
August	$15.00	$15.26	$11.45	($3.81)	$11.19	($3.81)	($0.26)
September	$15.25	$15.55	$11.45	($4.10)	$11.15	($4.10)	($0.30)
October	$13.01	$12.30	$11.45	($0.85)	$12.16	($0.85)	$0.71
November	$11.97	$10.60	$11.45	$0.85	$12.82	$0.85	$1.37
December	$11.23	$10.97	$11.45	$0.48	$11.71	$0.48	$0.26
Averages	*$13.11*	*$12.61*	*$11.45*	*($1.16)*	*$11.95*	*($1.16)*	*$0.50*

Figure 6. Example of Proposed Forward Contracting in California, 2001



Again, evaluations such as these show how a forward contracting producer would have fared compared to a speculating producer under the conditions specified. Clearly, these examples are not exhaustive. Different assumptions would lead to different results, but several points are made clear. First, the potential exists for a participating producer to receive less than the overbase price and even less than the contract price. Second, a forward contracting arrangement does not by itself guarantee more revenue for producers. Third, a producer who is considering a forward contracting arrangement should be familiar with his or her own costs and know at what level the contract price will assure an adequate profit for the operation.

IX. b. Forward Contracting Operating Outside the Pool

Transactions between milk processors and dairy producers do occur outside the pool in California; there is nothing novel about a plant buying milk in a manner such that the revenues from the purchase of milk do not pass through the pool. However, no formal proposals for forward contracting in California have suggested letting the arrangements operate outside the auspices of the milk pooling program for two reasons. First, such a proposal would have to address minimum pricing of Grade A milk in California. Currently, all Grade A milk sold in California must receive at least the minimum appropriate class price. With a direct forward contracting arrangement that does not involve the pool, there is potential for the minimum pricing provision to be violated. In other words, the idea of forward contracting is for the producer and the processor to agree to a fixed price for a set period of time. In a shorter timeframe, it is very possible that a fixed price could be agreed to such that the minimum pricing provision would not be violated. However, it is unrealistic to suggest that this could continue for a longer time period, given the volatility of milk prices. A second reason why "depooling" any forward contracting arrangements lacks overt support is the effect on the non–participating producers. Class 4a and 4b milk are typically the lowest–valued milk in the pool for any given month. Depooling this milk, in theory, should **increase** pool prices. For the most part, this is true. Even averaged over a period of several months, this continues to be true. However, it is not accurate to say that in every month, pool prices would be higher. As is demonstrated below, there are months in which depooling a percentage of Class 4b milk actually **decreases** pool prices. In short, the prices received by producers who are not engaged in forward contracting are being affected, possibly negatively, by having the forward contracting arrangements operate outside of the pool. The upside of depooling the forward contracted milk is that the processor and participating producers can truly enter an agreement in which both parties receive the exact price to which they agreed.

In order to analyze what possible impact on prices the industry could expect by depooling milk, some groundwork must be laid. First, only Class 4b is considered. With so much of the butter and nonfat dry milk being processed by dairy cooperatives, there is little need to investigate the effects of depooling

Class 4a milk. The impact of depooling Classes 2 and 3 is very nearly the opposite of what is discussed in the next section, i.e., the issue of mandatory pooling of Classes 2 and 3. Second, Class 4b is depooled incrementally by month for 2000 and 2001 (Tables 4 and 5). Third, the analyses does not speak to the impact of the producers or processors engaged in forward contracting arrangements; the impact on those parties is tied directly to the specific contracts to which they agree.

Tables 4 and 5 show the net change in pool prices by month for 2000 and 2001 when a percentage of Class 4b milk is not pooled. With 2000 data, depooling any percentage of Class 4b milk in any month increases pool prices (Table 4). Toward the end of the year, pooling none of the Class 4b milk would have raised pool prices by more than $1.00 per hundredweight. While it is possible that a high percentage of Class 4b milk could be depooled, it is also unlikely. Given the level of participation in the federal program, there is apparently some reluctance from producers to engage in forward contracting arrangements. A more realistic expectation is to have up to 25 percent of Class 4b milk depooled. Under this assumption, the level of the pool price increases ranges from $0.05 to $0.27 per hundredweight. Averaged over 12 months, pool prices would have increased by $0.10 per hundredweight if 25 percent of the Class 4b milk was not run through the pool.

Table 4. Impact on Pool Prices by Pooling a Percentage of Class 4b Milk by Month, 2000

Percent Pooled	January	February	March	April	May	June
100	---	---	---	---	---	---
90	$ 0.02	$ 0.03	$ 0.03	$ 0.05	$ 0.06	$ 0.04
75	$ 0.05	$ 0.07	$ 0.08	$ 0.12	$ 0.16	$ 0.12
50	$ 0.11	$ 0.15	$ 0.17	$ 0.27	$ 0.35	$ 0.29
20	$ 0.20	$ 0.28	$ 0.31	$ 0.52	$ 0.67	$ 0.54
10	$ 0.24	$ 0.33	$ 0.38	$ 0.61	$ 0.79	$ 0.65
0	$ 0.28	$ 0.39	$ 0.44	$ 0.72	$ 0.95	$ 0.77

	July	August	September	October	November	December	Annual
100	---	---	---	---	---	---	---
90	$ 0.04	$ 0.03	$ 0.02	$ 0.08	$ 0.09	$ 0.09	$ 0.04
75	$ 0.08	$ 0.09	$ 0.03	$ 0.18	$ 0.27	$ 0.23	$ 0.10
50	$ 0.18	$ 0.19	$ 0.07	$ 0.41	$ 0.61	$ 0.53	$ 0.22
20	$ 0.34	$ 0.38	$ 0.14	$ 0.78	$ 1.16	$ 1.02	$ 0.42
10	$ 0.41	$ 0.45	$ 0.16	$ 0.94	$ 1.39	$ 1.23	$ 0.50
0	$ 0.48	$ 0.54	$ 0.20	$ 1.11	$ 1.67	$ 1.47	$ 0.59

For 2001, the results are more varied. In seven of the months, pooling any percentage of Class 4b milk raises pool prices (Table 5). In January, February and November, the effect of pooling none of the Class 4b milk is to raise the overbase price by at least $1.00 per hundredweight. Again, 25 percent of the Class 4b milk is a more realistic expected level of participation. For the seven months in which the pool prices are increased by not pooling Class 4b milk, increases ranged from $0.03 to $0.22 per hundredweight. On average for the entire year, pool prices would have been $0.09 per hundredweight higher if 25 percent of the Class 4b milk would have been depooled.

The results that show depooling any percentage of Class 4b milk mirror those results found when using 2000 data. The other five months present a new twist to the idea of not pooling forward contracted milk. As shown in Table 5, pool prices would actually **decrease** if any percentage of Class 4b milk is depooled. Using the same criterion as before, the effect of depooling 25 percent of Class 4b milk decreases pool prices by $0.01 to $0.04 per hundredweight. In summary, producers who are not participating in forward contracting arrangements may have their prices affected positively or negatively if forward contracting arrangements occur outside of the pool. However, it appears as though pool prices would normally be expected to increase if a percentage of Class 4b milk is depooled.

Table 5. Impact on Pool Prices by Pooling a Percentage of Class 4b Milk by Month, 2001

Percent Pooled	January	February	March	April	May	June
100	---	---	---	---	---	---
90	$ 0.09	$ 0.06	$ 0.04	$ 0.04	$ (0.01)	$ (0.01)
75	$ 0.22	$ 0.16	$ 0.10	$ 0.11	$ (0.02)	$ (0.01)
50	$ 0.50	$ 0.36	$ 0.23	$ 0.24	$ (0.03)	$ (0.02)
20	$ 0.94	$ 0.69	$ 0.46	$ 0.47	$ (0.07)	$ (0.03)
10	$ 1.13	$ 0.84	$ 0.56	$ 0.57	$ (0.09)	$ (0.04)
0	$ 1.35	$ 1.01	$ 0.67	$ 0.69	$ (0.09)	$ (0.04)

	July	August	September	October	November	December	Annual
100	---	---	---	---	---	---	---
90	$ (0.01)	$ (0.01)	$ (0.02)	$ 0.02	$ 0.06	$ 0.02	$ 0.03
75	$ (0.04)	$ (0.03)	$ (0.03)	$ 0.08	$ 0.15	$ 0.03	$ 0.09
50	$ (0.10)	$ (0.08)	$ (0.08)	$ 0.18	$ 0.36	$ 0.07	$ 0.21
20	$ (0.18)	$ (0.14)	$ (0.16)	$ 0.35	$ 0.69	$ 0.13	$ 0.41
10	$ (0.21)	$ (0.17)	$ (0.19)	$ 0.43	$ 0.83	$ 0.16	$ 0.49
0	$ (0.26)	$ (0.21)	$ (0.22)	$ 0.51	$ 1.00	$ 0.19	$ 0.60

X. Mandatory Pooling of Class 3 Milk

X. a. Background

Recent technological advances for extracting the valuable components of milk using filtration have given way to possibilities for concentrating milk on farms. Reverse osmosis (RO) uses high pressure and specially designed filters to remove water from milk, leaving a highly concentrated product. While RO is not a new technology by itself, the practical application of RO to milk and the dairy industry is novel. Ice cream processors have experimented with the concentrated product, called retentate, and have found that an acceptable if not superior product can be produced. As such, an arrangement between a producer and an ice cream processor could be developed in which the producer installs and operates an RO facility and ships the retentate directly to the ice cream processor. This potential relationship may have implications for the manner in which revenues from milk sales are pooled and distributed among dairy producers.

The industry proposal to mandate pooling of Class 2 and 3 milk would greatly diminish the likelihood of any such partnerships forming. While the proposal would have mandated participation in the pool of Class 2 milk, the impact of doing so would be minimal. The reason is that, by law, nearly all Class 2 products are already pooled. Thus, the analysis given here will review only the impact of pooling or not pooling Class 3 milk.

X. b. Analysis of Mandatory Pooling of Class 3 Milk

Two regulatory points impact directly any such arrangement between an ice cream plant and a producer. First, plants processing Class 1 products and nearly all Class 2 products are mandated to participate in the pool. However, plants processing all other products, including ice cream, are **not** required to participate in the pool. Second, all Grade A milk is subject to announced minimum prices for the five classes of milk. It should be clear from the first point that an arrangement between an ice cream plant and a producer does not need to run through the pool, i.e., revenues from those sales do not need to be shared with other producers. Furthermore, a producer who receives the Class 3 price directly for his or her milk generally fares better than a producer who receives the overbase price. In fact, it is likely that a producer who receives the Class 3 price directly will fare better than producers who receive the quota price for at least a portion of their milk (Table 6).

The Class 3 prices are shown in relation to the pool prices for the corresponding months. The last column shows what percent of quota needs to be owned to result in a price equal to the Class 3 price. For example, in February 2000, a producer would have needed to receive the quota price on 82 percent (and the overbase price on 18 percent) of his or her milk to equal the

Class 3 price. Table 6 further shows that there is a huge financial incentive for a producer to pursue the aforementioned arrangement. In eight of the 24 months represented, the Class 3 price would have been higher than a producer who receives the quota price on 100 percent of his or her milk. In only one month, May 2001, was the Class 3 price actually lower than overbase price. On average, a producer would have to receive the quota price on 78 percent of his or her milk to equal the Class 3 price.

Table 6. Relationship of the Class 3 Price to Pool Prices, Dollars per Hundredweight
January 2000 to December 2001

	Class 3	Quota	Overbase	Percent Quota Needed
January 2000	12.17	11.75	10.05	>100
February	11.34	11.65	9.95	82
March	11.34	11.72	10.02	78
April	11.54	12.06	10.36	69
May	11.54	12.24	10.54	59
June	12.32	12.78	11.08	73
July	12.32	13.00	11.30	60
August	12.68	13.02	11.32	80
September	12.68	13.31	11.61	63
October	12.50	12.29	10.59	>100
November	12.50	12.68	10.98	89
December	13.19	12.98	11.28	>100
January 2001	13.19	12.73	11.03	>100
February	13.21	13.04	11.34	>100
March	13.21	13.88	12.18	61
April	13.58	14.65	12.95	37
May	13.58	15.70	14.00	<0
June	15.19	16.45	14.75	26
July	15.19	16.34	14.64	32
August	15.41	16.70	15.00	24
September	15.41	16.95	15.25	9
October	15.73	14.71	13.01	>100
November	15.73	13.67	11.97	>100
December	12.77	12.93	11.23	91
Average	*$13.26*	*$13.63*	*$11.93*	*78*

In addition to the clear advantage to an individual producer as discussed above, there are implications for non–participating producers. As with the forward contracting issue, producers who are not engaged with a processor in any kind of "outside the pool" arrangement will be affected by the ones who are. In other words, diverting money away from the pool in favor of more direct arrangements will necessarily affect those producers who remain dependent on the pool. As a result, a proposal was introduced in 1999 that would mandate that plants processing Class 3 products must participate in the pool. Such a mandate would greatly diminish the financial incentive for producers to invest in RO facilities.

Under the current industry structure, there would be no impact if the proposal to mandate pool participation by Class 3 plants were to be implemented. This is because all Class 3 milk is currently pooled. Also, there are no on–farm RO facilities in operation, without which the direct transaction between ice cream plant and producer is unlikely to occur. Tables 7 and 8 review the potential

impact on pool prices by month if a given percentage of Class 3 milk is not run through the pool. Actual Class 3 and pool price data from 2000 and 2001 are used to determine to what extent would pool prices be affected.

The results follow expectations for most of the months reviewed, that is, pool prices decrease when any percentage of Class 3 milk is not pooled. In Table 7, this is shown to be true for 10 of the 12 months. In the most extreme case in which none of the Class 3 milk is pooled, pool prices would have been $0.07 per hundredweight lower. However, in two of the months, May and November, pool prices would have been ***higher*** if any percentage of Class 3 milk was not pooled. This apparent anomaly is the result of relative class prices, i.e., in both cases, the Class 4a price was higher than the Class 3 price and higher than the Class 4b price. Over the entire year, pool prices would have been slightly lower if all of the transactions for Class 3 milk occurred outside of the pool.

Table 7. Impact on Pool Prices by Pooling a Percentage of Class 3 Milk by Month, 2000

Percent Pooled	January	February	March	April	May	June
100	---	---	---	---	---	---
90	($0.00)	($0.00)	($0.00)	($0.01)	$0.00	($0.00)
75	($0.02)	($0.01)	($0.00)	($0.01)	$0.01	($0.00)
50	($0.04)	($0.02)	($0.01)	($0.01)	$0.02	($0.01)
20	($0.06)	($0.05)	($0.02)	($0.01)	$0.04	($0.01)
10	($0.07)	($0.05)	($0.03)	($0.02)	$0.05	($0.01)
0	($0.07)	($0.05)	($0.03)	($0.02)	$0.05	($0.01)

	July	August	September	October	November	December	Annual
100	---	---	---	---	---	---	---
90	($0.00)	($0.00)	($0.00)	($0.01)	$0.00	($0.00)	($0.00)
75	($0.00)	($0.02)	($0.01)	($0.01)	$0.00	($0.01)	($0.01)
50	($0.01)	($0.04)	($0.02)	($0.04)	$0.01	($0.01)	($0.02)
20	($0.01)	($0.06)	($0.04)	($0.05)	$0.01	($0.02)	($0.02)
10	($0.01)	($0.07)	($0.04)	($0.06)	$0.01	($0.02)	($0.03)
0	($0.01)	($0.07)	($0.05)	($0.07)	$0.01	($0.02)	($0.03)

Table 8 also shows mixed results. Again, in seven of the months during 2001, not pooling the revenues from the sale of milk to Class 3 plants decreases pool prices. In the most noticeable case, October, pool prices would have been decreased by $0.20 per hundredweight if none of the Class 3 milk were pooled. The decrease is very nearly offset entirely by the results for April, in which pool prices would have been $0.18 per hundredweight higher if none of the Class 3 was pooled. Again, the odd–appearing results are a function of relative class prices. In particular, the April 2001 Class 4a price was $14.32, the Class 3 price was $13.57 and the Class 4b price was $12.12. On average for 2001, pool prices would have been very slightly lower.

Table 8. Impact on Pool Prices by Pooling a Percentage of Class 3 Milk by Month, 2001

Percent Pooled	January	February	March	April	May	June
100	---	---	---	---	---	---
90	($0.01)	($0.01)	($0.01)	$0.00	$0.02	$0.00
75	($0.01)	($0.01)	($0.01)	$0.02	$0.04	$0.00
50	($0.03)	($0.03)	($0.02)	$0.03	$0.08	$0.01
20	($0.06)	($0.05)	($0.02)	$0.06	$0.13	$0.02
10	($0.07)	($0.05)	($0.03)	$0.07	$0.15	$0.02
0	($0.08)	($0.06)	($0.03)	$0.07	$0.18	$0.02

	July	August	September	October	November	December	Annual
100	---	---	---	---	---	---	---
90	($0.00)	$0.00	$0.01	($0.02)	($0.00)	($0.00)	($0.00)
75	($0.00)	$0.00	$0.01	($0.06)	($0.00)	($0.00)	($0.00)
50	($0.00)	$0.01	$0.03	($0.10)	($0.02)	($0.02)	($0.01)
20	($0.00)	$0.01	$0.05	($0.16)	($0.03)	($0.03)	($0.01)
10	($0.00)	$0.02	$0.06	($0.18)	($0.04)	($0.04)	($0.01)
0	($0.00)	$0.02	$0.06	($0.20)	($0.04)	($0.04)	($0.01)

As with the forward contracting sections of this report, the examples shown above are not exhaustive; they are not meant to be. They merely point out some possible outcomes given the assumptions used. Of course, different assumptions may lead to different results. Notwithstanding this, two main points can be gleaned from the examples presented, given the data used in the analysis. First, a producer who contracts with a Class 3 plant outside of the pool nearly always fare better than a producer who receives the overbase price strictly and will likely fare better than a producer who receives some combination of the quota price and the overbase price for his or her milk. Second, depooling a percentage of Class 3 milk may increase or decrease pool prices, depending on the relative class prices for a particular month. On an annual basis, pool prices would tend to be very slightly lower.

As a final note, mandatory pooling of Class 3 milk may appear attractive because any negative impacts on pool prices as a result of not pooling those revenues will be eliminated. What is not revealed in the analysis is what is best for the California dairy industry in the long run. Additional regulation that may inadvertently stifle innovation may not be in the best interest of the dairy industry. Mandatory pooling of Class 3 milk will tend to inhibit investments in on–farm reverse osmosis facilities.

XI. Protein Pricing

XI. a. Premiums in the Dairy Industry

As stated in the introduction of this report, California and federal orders set only minimum milk prices. Pricing regulations do not restrict processors from

offering payments or "premiums" above minimum prices. Premiums often depend on measurable quality differences in milk, competitive market factors and producer bargaining power. While premiums may be prevalent for any of the classes of milk, they are most often paid by cheese processors. Many cheese processors pay premiums, but the manner in which the premiums are paid varies significantly. A key point to keep in mind about premiums is that they are not shared among producers. A producer may keep the premium that is paid to him or her; premiums do not run through the pool.

Development of premium structures outside of the regulated system have allowed cheese plants to attract the type of milk that is best suited for their operations. From a dairy producer's point of view, the availability of premiums has altered management decisions, the most basic of which is deciding what breed of dairy cow can generate the most profit for the operation. For many years, Holstein cows had been replacing all other breeds in California. With the development of the cheese industry and introduction of protein premiums, Jersey cows, which tend to produce milk with high protein and butterfat, are making a significant comeback. If a regulated protein price were established, this trend may be slowed and even reversed to the detriment of the California cheese industry.

XI. b. Appropriate Milk Prices

The derivation of appropriate milk prices is a lesson in evolution unto itself. Milk prices based only on the weight of milk gave way to butterfat–based pricing systems, and eventually, multiple component pricing. In the latter system, the *components* of milk are priced and not the milk itself. An effective component pricing system will attempt to accomplish two potentially conflicting goals. First, the total value of milk components in finished products will be captured. Second, the presence of the pricing system will facilitate the movement of milk to the most appropriate processing plants. Inherent to this supposition is that different types of milk are better suited for some dairy products than other types of milk. This is particularly true for cheese processors; milk with higher tests for fat and protein are preferred because of the positive impact on cheese yields.

The pricing of milk intended for cheese production should take into account the additional value imparted by the higher levels of protein and butterfat. However, this statement begs the question, should the valuing of components, particularly protein, be regulated or not? At the philosophical level, the industry has not been able to develop a consensus to this question. Even in practice, the answer to the question is not clear. Seemingly, the federal order and California milk pricing systems are at odds on this issue. In seven of the 11 federal orders in which cheese production is significant, milk used to make cheese is priced on fat, protein and other solids. In California, milk used to make cheese is priced on fat and solids–not–fat.

The difference in the two systems has been one impetus for a faction within the California dairy industry to propose that pricing based on protein and other solids replace solids–not–fat pricing as part of the logical evolution of multiple component pricing. Not coincidentally, the faction leading the charge for the proposed change is comprised largely of butter and nonfat dry milk processors who have not and do not pay premiums for milk used to produce butter and nonfat dry milk. One argument that has been used in favor of protein pricing is that the full market value of butter and nonfat dry milk is captured by minimum prices and shared by all producers while the same cannot be said for cheese. They view regulated protein pricing as a way to re–establish equity among producers and to share equally the higher value obtained from milk used to produce cheese.

XI. c. Anticipated Effect of Protein Pricing in California

The dairy industry is dynamic and responsive, and therefore, it is difficult to say with any certainty what the possible impacts of instituting a regulated protein pricing system might be. Nevertheless, it seems apparent that there would be a reduction in premium levels as some of the value of protein would be captured in the minimum prices. Furthermore, there would also seem to be a transfer of money among dairy farmers — money would be transferred from producers currently receiving protein premiums to all other producers. Regulated protein pricing would generally be opposed by cheese processors and dairy farmers shipping to them and be favored by the remaining dairy farmers, their cooperatives, and producer trade associations. Proponents of protein pricing will tend to become more vocal when the strength of the butter and nonfat dry milk markets exceeds that of the cheese market. In other words, when the combined value of butter and nonfat dry milk exceeds that of cheese, the greater the apparent inequity. Also, regulated protein pricing would likely receive no strong support or opposition by dairy processors not making cheese, butter or nonfat dry milk and would likely have no effect on retail prices.

The debate of whether to include protein as a regulated milk component price will likely ignite discussion on other side issues. Opponents of protein pricing may wish to discuss the sharing of other premiums being paid by non–cheese making processors. The argument is likely to be couched in the vein that if cheese premiums are to be shared among all producers then **all** premiums should be shared. The definition of what constitutes a premium will be critical to such discussion. If a premium is viewed as any money paid over the minimum announced class price, then service charges paid to cooperatives will very likely be questioned. A “service charge” is a generic term for above–minimum–price payments to cooperatives that provide milk supplies to processors. As the term implies, a service charge is paid in exchange for some level of service. It is possible that these payments will be analyzed by opponents of protein pricing to determine what fraction of the service charge can be associated with an actual activity and fraction appears to be a virtual premium.

XI. d. Quantitative Assessment of Protein Pricing

In late fall 2000, the Alliance of Western Milk Producers (Alliance) introduced a proposal for incorporating protein pricing into the Class 4b formula. The Alliance petitioned the Department of Food and Agriculture (Department) for and was granted a public hearing on the matter, which was later scheduled for March 28, 2001. Prior to the hearing, the Alliance requested that the proceeding on their proposal for protein pricing be postponed; the Department acted accordingly and withdrew from consideration any reference to protein pricing at the March 28, 2001 hearing. Notwithstanding these events, the proposal from the Alliance was sufficiently detailed to allow for an impact analysis. The protein pricing amendment to the Class 4b formula was proposed prior to changes to the Class 4b formula resulting from energy price increases, effective January 1, 2002. It seems likely that the protein pricing proposal would have been adjusted to reflect energy cost increases, but that assumption is not made here. Rather, the Class 4b formula that was in place at the time the protein pricing proposal was introduced to the industry is used as the reference standard in the analysis.

The impact of the Alliance's protein pricing proposal on the Class 4b price is given in Table 9 and in Figure 7. Using annual averages, the proposal would have increased the Class 4b price by between $0.18 and $0.56 per hundredweight. For the period 1994 to 2001, the Class 4b would have been an average of $0.42 per hundredweight higher. All of the increase comes on the non–fat portion of the formula, i.e., the solids–not–fat price used in the Class 4b formula would be replaced with prices for protein and other solids, and the fat price would have been unchanged. On a monthly basis, the proposed pricing formula would have been higher than the corresponding current formula in all but two of the 96 months reviewed (Figure 7).

Table 9. Comparison of Proposed Protein Pricing with Current Class 4b Formula, *Annual Averages, 1994 to 2001*

	Protein	Class 4b	Difference
1994	$11.53	$11.04	$0.49
1995	$11.74	$11.18	$0.56
1996	$13.39	$12.83	$0.56
1997	$11.74	$11.26	$0.47
1998	$14.22	$13.89	$0.33
1999	$12.65	$12.36	$0.29
2000	$9.87	$9.69	$0.18
2001	$13.09	$12.61	$0.48
Average	*$12.28*	*$11.86*	*$0.42*

While the proposal addresses clearly how changes are to be made to the minimum Class 4b price after implementation, the proposal was vague on how the introduction of protein pricing would be handled on the pool price side. Money would be paid into the pool based on protein usage in Class 4b plants, but the proposed method for making payments to producers appears to be in conflict with existing legislation.

The means for establishing pool prices is contained in Chapter 3.5 of the Food and Agricultural Code. There is no mention of protein as a component, upon which payment can be based. While it is true that protein is a sub–component of the more general category of solids–not–fat, it is not clear that payments based on protein content can occur without changes to Chapter 3.5 of the Food and Agricultural Code.

Figure 7. Comparison of Proposed Class 4b Formula Incorporating Protein Pricing and the Corresponding Class 4b Pricing